

Modified ASTM E-119

A composite panel 28" x 36" made of glass skins and 5/8" thick balsa core was SCRIMP[®]ed with vinyl ester resin with thermocouples embedded at various depths in the composite. Each location had two thermocouples for redundancy as shown in Figure 1. After fabrication, approximately 1/16" of Thermashield was applied to one surface. The panel was post cured at 140°F for 8 hours to insure complete cure and evaporation of the mastic fire barrier.

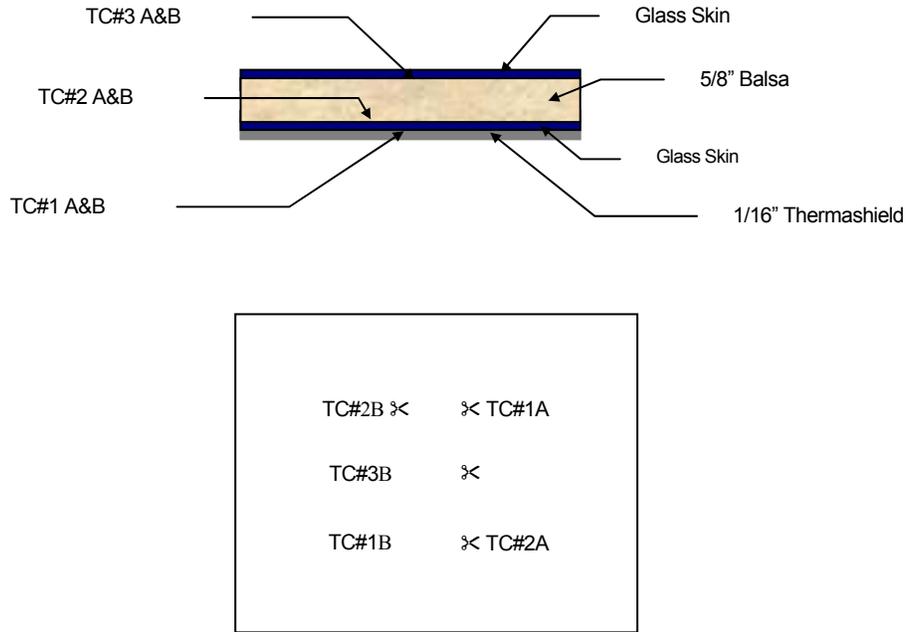


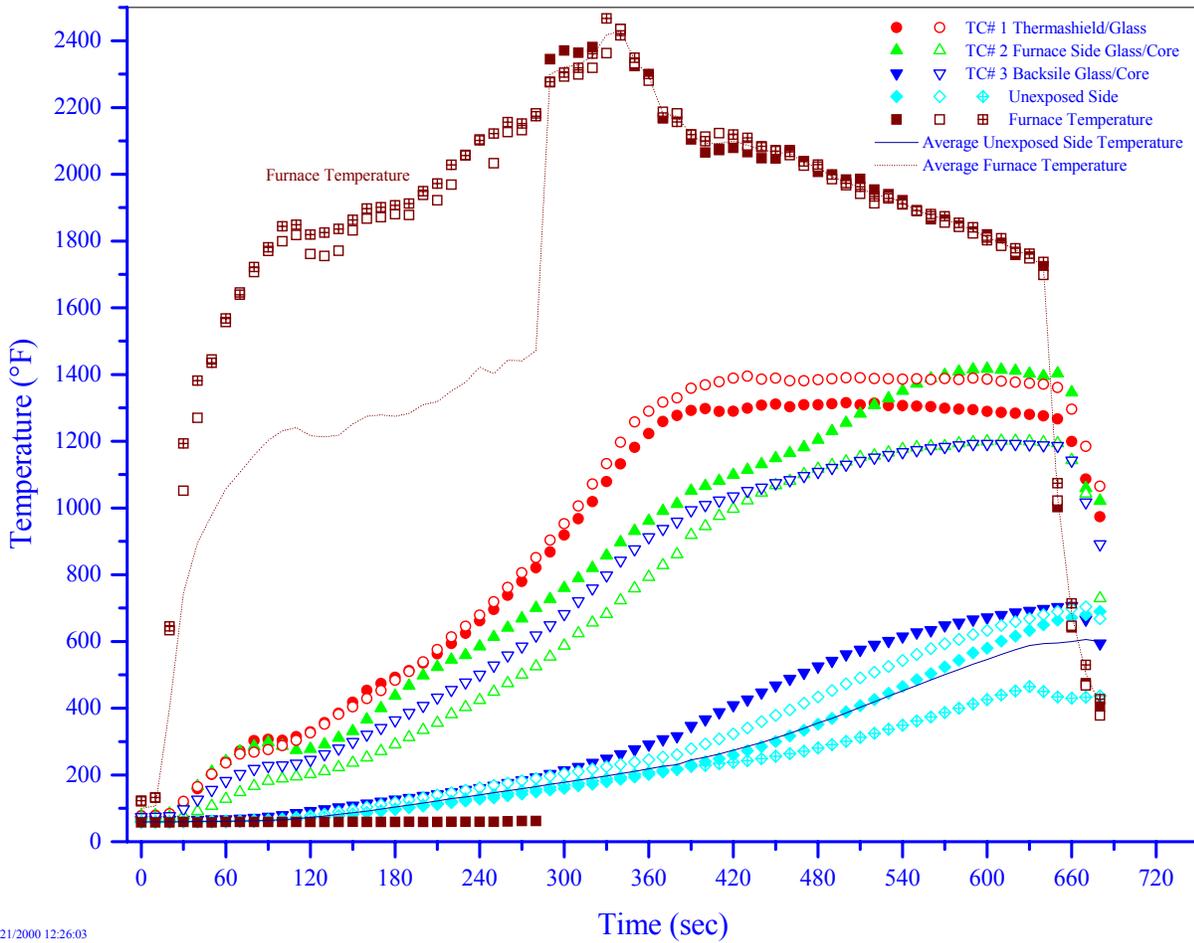
Figure 1. Schematic of composite panel tested at 2000°F illustrating location of thermocouples.

The purpose of the test was to determine whether the Thermashield product survived a 2000°F fire for “some” period of time. TPI Composites, Inc. arbitrarily selected a five minute exposure as the required time. Figure 2. plots the thermal profile the panel was exposed to and the temperature measurements at various locations summarized in Table 1.

Table 1. Embedded thermocouple location within composite panel.

Thermocouple#	Measurement Location
1 (A&B)	Furnace side between Thermashield and glass skin
2 (A&B)	Furnace side between glass skin and balsa core
3 (A&B)	Back side between glass skin and balsa core

Modified E-119 Evaluation of Thermashield



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Figure 2. Temperature data of various thermocouple during 2000°F test of Thermashield.

Post Test Observations:

There was evidence of intumescent expansion over the surface of the panel with some areas showing more expansion than others. Some of the intumescent coating may have ablated during the test or fallen off during removal of the panel from the furnace. The inner glass skin and core were charred, however the furnace temperature did exceed 2400°F after the test was “shut-down”. It is difficult to determine how effectively the coating protected the core, however, back side temperature stayed below 250°F during the test. The outer skins were still intact after the “autopsy”. (A screwdriver could not be pressed through the backside glass skins).

As a comparison, a unprotected sample will be fabricated and tested to determine relative effectiveness of the thermal barrier.